

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Donovan D / 2-6JI

Location: S-2 T-3N R-64W

Rig Name: Production

State/County: Colorado/ Weld County

Latitude: 40.26, Longitude: -104.52

GRID North is 0.63 Degrees East of True North

VS-Azi: 0.00 Degrees

GTI

GYRO TECHNOLOGIES, INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 5/2/2011 / 10:19

Vaughn Energy Services

Denver, CO

720-215-1841

Robert Davis

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.64	72.56	100.00	0.17	0.53	0.17	0.56	72.56	0.64
200.00	0.42	86.19	199.99	0.36	1.43	0.36	1.47	75.92	0.25
300.00	0.53	75.43	299.99	0.50	2.24	0.50	2.30	77.46	0.14
400.00	0.29	110.98	399.99	0.52	2.92	0.52	2.97	79.87	0.33
500.00	0.68	93.54	499.98	0.39	3.75	0.39	3.77	84.00	0.41
600.00	1.13	115.30	599.97	-0.06	5.24	-0.06	5.24	90.70	0.56
700.00	1.02	137.13	699.95	-1.14	6.73	-1.14	6.83	99.60	0.42
800.00	1.10	119.64	799.94	-2.27	8.18	-2.27	8.48	105.50	0.33
900.00	0.95	132.97	899.92	-3.30	9.61	-3.30	10.17	108.97	0.28
1000.00	0.87	123.72	999.91	-4.29	10.85	-4.29	11.66	111.56	0.17
1100.00	0.91	143.86	1099.90	-5.35	11.95	-5.35	13.09	114.12	0.31
1200.00	0.94	125.87	1199.88	-6.47	13.08	-6.47	14.60	116.33	0.29
1300.00	0.91	135.59	1299.87	-7.52	14.31	-7.52	16.16	117.74	0.16
1400.00	0.84	152.86	1399.86	-8.74	15.19	-8.74	17.53	119.91	0.27
1500.00	0.72	159.21	1499.85	-9.97	15.75	-9.97	18.64	122.34	0.15
1600.00	0.64	147.08	1599.84	-11.02	16.27	-11.02	19.66	124.12	0.16
1700.00	0.74	168.61	1699.84	-12.12	16.70	-12.12	20.64	125.97	0.27
1800.00	0.63	178.70	1799.83	-13.30	16.84	-13.30	21.46	128.31	0.16
1900.00	0.21	144.96	1899.83	-14.00	16.96	-14.00	21.99	129.55	0.47
2000.00	0.28	145.45	1999.83	-14.35	17.20	-14.35	22.40	129.84	0.07
2100.00	0.28	24.71	2099.83	-14.33	17.44	-14.33	22.57	129.40	0.49
2200.00	0.43	28.90	2199.82	-13.77	17.72	-13.77	22.45	127.85	0.15
2300.00	0.72	35.75	2299.82	-12.93	18.27	-12.93	22.39	125.29	0.30
2400.00	1.03	49.59	2399.81	-11.84	19.33	-11.84	22.66	121.49	0.37
2500.00	1.12	60.21	2499.79	-10.77	20.86	-10.77	23.48	117.29	0.22
2600.00	0.98	39.72	2599.77	-9.62	22.26	-9.62	24.25	113.38	0.40
2700.00	0.85	56.81	2699.76	-8.56	23.42	-8.56	24.94	110.08	0.30
2800.00	0.73	71.92	2799.75	-7.96	24.65	-7.96	25.90	107.89	0.24
2900.00	0.50	89.34	2899.74	-7.75	25.70	-7.75	26.84	106.79	0.29
3000.00	0.41	88.60	2999.74	-7.74	26.49	-7.74	27.60	106.29	0.09
3100.00	0.57	102.97	3099.74	-7.84	27.34	-7.84	28.44	106.01	0.20
3200.00	0.69	112.39	3199.73	-8.19	28.38	-8.19	29.54	106.09	0.16
3300.00	1.57	131.57	3299.71	-9.32	29.96	-9.32	31.38	107.29	0.94
3400.00	1.92	143.78	3399.67	-11.59	31.98	-11.59	34.01	109.92	0.51

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3500.00	1.56	156.67	3499.62	-14.19	33.51	-14.19	36.39	112.95	0.54
3600.00	1.19	155.41	3599.59	-16.38	34.48	-16.38	38.17	115.41	0.37
3700.00	1.44	143.25	3699.56	-18.33	35.66	-18.33	40.10	117.21	0.37
3800.00	1.37	158.26	3799.53	-20.45	36.86	-20.45	42.15	119.02	0.37
3900.00	1.38	147.94	3899.51	-22.58	37.94	-22.58	44.15	120.76	0.25
4000.00	1.41	157.53	3999.48	-24.73	39.05	-24.73	46.22	122.35	0.23
4100.00	1.54	160.09	4099.44	-27.13	39.97	-27.13	48.31	124.16	0.15
4200.00	2.02	145.52	4199.40	-29.84	41.43	-29.84	51.06	125.77	0.65
4300.00	2.54	138.71	4299.32	-32.96	43.89	-32.96	54.88	126.90	0.59
4400.00	2.74	141.94	4399.21	-36.50	46.82	-36.50	59.37	127.94	0.25
4500.00	2.56	151.04	4499.10	-40.34	49.37	-40.34	63.76	129.25	0.46
4600.00	2.64	156.91	4599.00	-44.41	51.36	-44.41	67.89	130.85	0.28
4700.00	2.47	168.77	4698.90	-48.64	52.68	-48.64	71.70	132.71	0.55
4800.00	2.15	168.65	4798.82	-52.59	53.47	-52.59	74.99	134.52	0.32
4900.00	1.86	172.64	4898.76	-56.04	54.05	-56.04	77.85	136.04	0.32
5000.00	1.92	168.46	4998.71	-59.29	54.59	-59.29	80.60	137.37	0.15
5100.00	1.79	183.93	5098.65	-62.49	54.82	-62.49	83.13	138.74	0.52
5200.00	1.45	178.48	5198.61	-65.31	54.75	-65.31	85.22	140.03	0.36
5300.00	1.39	155.62	5298.58	-67.69	55.28	-67.69	87.39	140.76	0.57
5400.00	1.62	166.86	5398.55	-70.17	56.10	-70.17	89.84	141.36	0.38
5500.00	1.49	175.45	5498.51	-72.84	56.52	-72.84	92.20	142.19	0.27
5600.00	1.36	168.51	5598.48	-75.30	56.86	-75.30	94.36	142.94	0.22
5700.00	1.16	148.06	5698.46	-77.33	57.64	-77.33	96.45	143.30	0.49
5800.00	0.99	173.45	5798.44	-79.05	58.27	-79.05	98.21	143.60	0.50
5900.00	1.22	176.22	5898.42	-80.98	58.44	-80.98	99.86	144.18	0.23
6000.00	1.22	172.96	5998.40	-83.10	58.64	-83.10	101.71	144.79	0.07
6100.00	1.02	166.93	6098.38	-85.03	58.98	-85.03	103.48	145.25	0.23
6200.00	1.30	157.11	6198.36	-86.94	59.62	-86.94	105.42	145.56	0.34
6300.00	1.01	139.83	6298.34	-88.66	60.63	-88.66	107.40	145.63	0.45
6400.00	1.09	125.40	6398.32	-89.88	61.97	-89.88	109.17	145.41	0.27
6500.00	0.95	113.64	6498.31	-90.76	63.50	-90.76	110.77	145.02	0.25
6600.00	0.91	113.77	6598.29	-91.42	64.99	-91.42	112.17	144.59	0.04
6700.00	0.62	77.92	6698.29	-91.62	66.25	-91.62	113.07	144.13	0.55
HORIZONTAL DISPLACEMENT IS 113.07 FEET AT 144.13 DEGREES									